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PLANETARY PHENOMENA FOR JANUARY AND FEBRUARY, 1920

BY MALCOLM McNEILL

PHASES OF THE MOON, PACIFIC TIME

| | | | |
|-------------------|---|------------------|---|
| Full Moon..... | Jan. 5, 1 ^h 5 ^m P. M. | Full Moon..... | Feb. 4, 12 ^h 42 ^m A. M. |
| Last Quarter..... | " 12, 4 9 P. M. | Last Quarter... | " 11, 12 49 P. M. |
| New Moon..... | " 20, 9 27 P. M. | New Moon..... | " 19, 1 35 P. M. |
| First Quarter.... | " 28, 7 38 A. M. | First Quarter... | " 26, 3 49 P. M. |

The Earth comes to perihelion, reaching its least distance from the Sun on January 3rd, 2 P. M., Pacific Time.

Mercury begins the year as a morning star, having passed greatest west elongation on December 21st. It gradually nears the Sun and passes superior conjunction on February 5th, becoming an evening star. By the end of the month it has nearly reached greatest east elongation. There are, however, only moderately good conditions for visibility either as morning or as evening star. During the first few days in January it rises a few minutes more than an hour before sunrise and may be seen if weather conditions are favorable. At the end of February the conditions are somewhat better from the standpoint of the interval between the setting of the Sun and of the planet, and the planet is two or three times as bright on February 29th as on January 1, 1920, so that it will be a comparatively easy object for naked-eye view during the last few evenings of February. The principal reason for this increased brightness in February is the fact that it passes perihelion on February 29th. On February 13th it is in conjunction with *Uranus* passing about 1° south of the latter.

Venus is also a morning star on January 1st and will continue to be so until early July, when it passes superior conjunction with the Sun. On January 1st it rises more than three hours before sunrise, but this interval diminishes to less than an hour and a half by the end of February. The apparent distance between Sun and planet diminishes only about one-third during the two months, while the planet's motion relative to the Sun brings it much farther south of that body and causes a marked diminution of the interval between the rising of the planet and the Sun. The planet is in the part of its orbit farthest from the Earth, but its brightness is still much greater than that of any heavenly body except the Sun or the Moon.

Mars during 1919 was not in good position for observation, but 1920 is comparatively a good year, as the planet will come to opposition on April 21st. It will be an easy object during the whole of the year and during the spring and summer quite a prominent one, altho not nearly as bright as it is when the opposition comes in August. This will happen in 1924. On January 1st it rises shortly before 1 A. M., and at the end of February at about 10:30 P. M. During the two months it moves about 20° eastward and 7° southward from a point in *Virgo* near the first magnitude star *Spica*, a *Virginis*, to a point in *Libra*. Its distance from the Earth grows rapidly less, the diminution being fifty-five millions of miles, about 40% of its January 1st distance. Mainly in consequence of this its light more than doubles. On January 1st it is not quite as bright as a standard first magnitude star, being just about as bright as *Spica*, the star east and south of the planet, the ruddy color of the planet easily distinguishing it.

Jupiter is in fine position for observation as it comes to opposition with the Sun on the evening of February 2nd, then rising at sunset and setting at sunrise. On January 1st it rises less than three hours after sunset; at the end of February it sets more than an hour before sunrise. It moves from the western part of *Leo* into *Cancer* 7° westward and 2° northward. As the distance of the planet from the Earth varies relatively much less than that of *Mars*, the variation in brightness is also much less, but it will lose nearly half of its brightness by the time it reaches conjunction in August. As the Earth is nearly in the plane of the satellites' orbits the apparent motion of the satellites is nearly rectilinear forward and backward across the disk of the planet.

Saturn is also in fine position for observation to the eastward of *Jupiter*. It comes to opposition with the Sun on February 27th. On January 1st it rises shortly before 10 P. M. and at the end of February a little before sunset. It is in the constellation *Leo* and like *Jupiter* is moving westward and northward, but only about half the amount. The brightest star in *Leo*, *Regulus*, lies between the two planets.

Uranus is in the southwestern sky in the evening but is too close to the Sun for naked-eye view. It passes conjunction with the Sun and becomes a morning star on February 21st. Its conjunction with *Mercury* on February 13th has already been mentioned.

Neptune is in the same part of the sky as *Jupiter* and comes to opposition with the Sun at midnight January 30th, about three days before *Jupiter*. It is too faint for naked-eye view.

CHANGE OF ADDRESS

Notice is given that the headquarters of the Astronomical Society of the Pacific have been removed to Room 709 Postal Telegraph Building, 22 Battery St., San Francisco. Communications for Mr. D. S. Richardson, the Secretary-Treasurer of the Society, should be sent to this address.